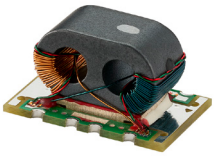
SURFACE MOUNT

Bi-Directional Coupler SYBDC-20-61WHP+

50Ω 20 dB Coupling 0.2 to 60 MHz 80 Watt

THE BIG DEAL

- High power handling, up to 80W
- Low mainline loss, 0.15 dB typ.
- High directivity, 20 dB typ.
- Excellent VSWR, 1.12:1 typ.



CASE STYLE: AH1647-5

Generic photo used for illustration purposes only

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Military mobile
- Signal monitoring

PRODUCT OVERVIEW

Mini-Circuits' SYBDC-20-61WHP+ surface mount bi-directional coupler provides high power handling up to 80W and low mainline loss of 0.15 dB typically for applications from 0.2 to 60 MHz. The coupler features core and wire construction mounted on an 8-lead printed laminate base with wrap-around terminations for excellent solderability. The unit measures 0.433 x 0.690 x 0.400 ", accommodating dense circuit board layouts.

KEY FEATURES

Feature	Advantages
High power handling, 80W	Usable in many systems with high-power requirements
Low mainline loss, 0.15 dB typ.	Provides excellent through-path signal power transmission
Good directivity, 20 dB typ.	High directivity allows accurate signal sampling through the coupled port with minimal measurement error
Excellent VSWR, 1.12 dB typ. (input/output/coupling)	Provides excellent matching in 50Ω systems with minimal signal reflection
Small size, 0.433 x 0.690 x 0.400 "	Provides high power capability while saving space in systems with tight layouts

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ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		0.2		60	MHz
Mainline Loss (above theoretical 0.044 dB)	1-30 0.2-60	— —	0.08 0.15	0.25 0.30	dB
Coupling	0.2-60	19.5	20.5	21.5	dB
Coupling Flatness(±)	0.2-60	—	0.05	0.2	dB
Directivity	1-30 0.2-60	20 15	25 20	— —	dB
Return Loss (Input)	0.2-60	18	25	—	dB
Return Loss (Output)	0.2-60	18	25	—	dB
Return Loss (Coupled)	1-30	18	24	—	dB
Input Power	0.2-60	—	—	80	W

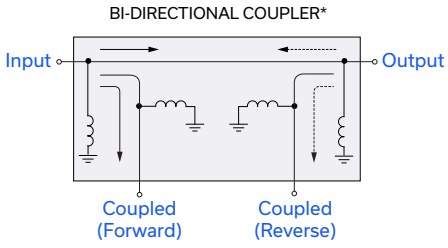
1. Measured on Mini-Circuits board TBSYBDC2061WHP+ with test board loss deducted.

MAXIMUM RATINGS*

Parameter	Ratings
Operating Temperature	-40°C to 65°C Case*
Storage Temperature	-55°C to 100°C

*Case temperature is defined as temperature on ground leads.
Permanent damage may occur if any of these limits are exceeded.

ELECTRICAL SCHEMATIC



*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground

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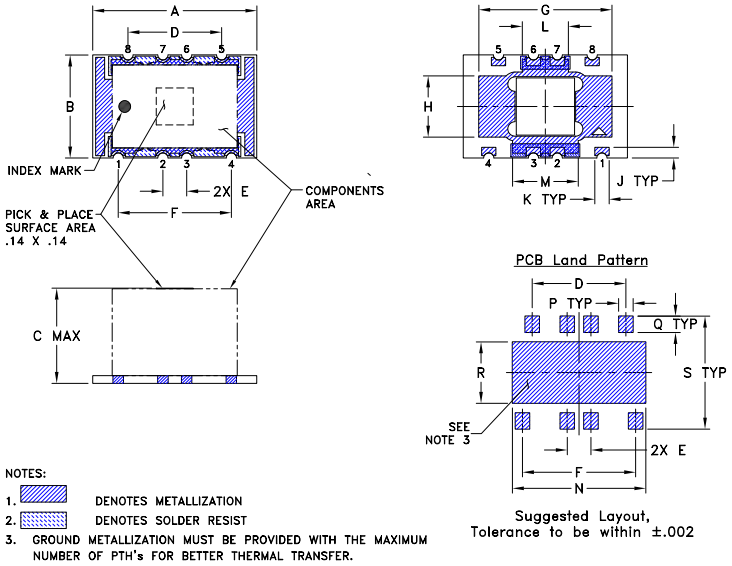
PAD CONNECTIONS

INPUT	1
OUTPUT	8
COUPLED (FORWARD)	4
COUPLED (REVERSE)	5
GROUND	2, 3, 6, 7

PRODUCT MARKING: N/A

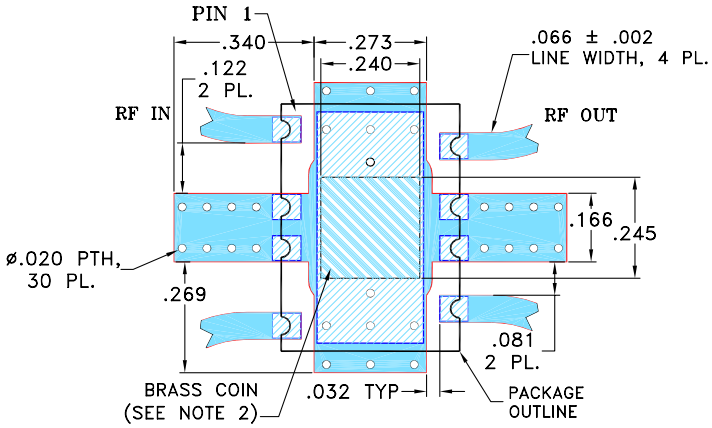
OUTLINE DRAWING



NOTES:
1. DENOTES METALLIZATION
2. DENOTES SOLDER RESIST
3. GROUND METALLIZATION MUST BE PROVIDED WITH THE MAXIMUM NUMBER OF PTH's FOR BETTER THERMAL TRANSFER.

EVALUATION BOARD MCL P/N TBSYBDC2061WHP+

SUGGESTED PCB LAYOUT (PL-351)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. SUGGEST TO PROVIDE BRASS COIN FOR BETTER HEAT TRANSFER FROM THE UNIT. OTHERWISE PROVIDE ARRAY OF THERMAL VIAS ADEQUATE TO LIMIT TEMPERATURE OF GROUND CONNECTIONS UNDER THE UNIT TO 65°C.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

DENOTES BRASS COIN.

OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F	G	H	J
.690	.433	.400	.394	.100	.476	.560	.257	.045
17.53	11.00	10.16	10.01	2.54	12.09	14.22	6.53	1.14

K	L	M	N	P	Q	R	S	wt
.060	.194	.276	.561	.061	.069	.258	.475	grams
1.52	4.93	7.01	14.25	1.55	1.75	6.55	12.07	3.40

TAPE & REEL INFORMATION: F109

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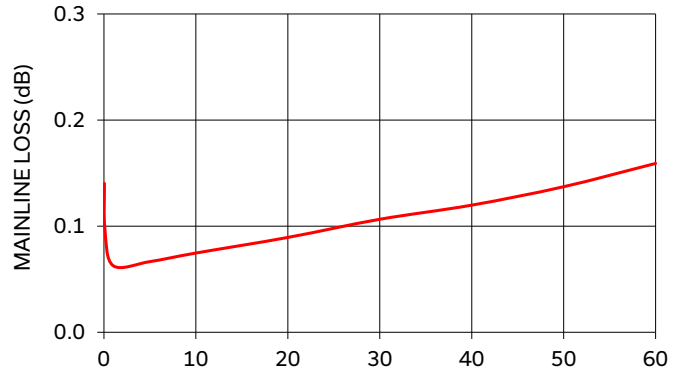
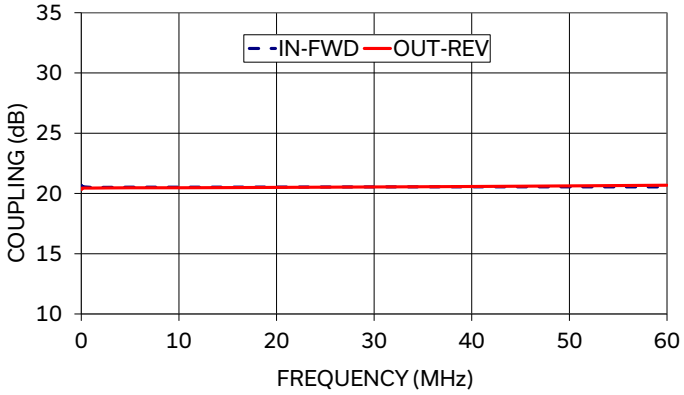
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	In-Cpl Rev	Out-Cpl Fwd	In	Out	Cpl Fwd	Cpl Rev
0.05	0.14	20.66	20.34	17.89	17.76	18.96	18.96	18.97	18.73
0.10	0.10	20.59	20.44	23.77	23.43	23.87	23.79	23.81	23.54
1	0.06	20.51	20.45	47.62	48.12	39.34	40.90	40.06	40.97
5	0.07	20.52	20.47	42.32	49.28	38.61	40.38	39.84	40.57
10	0.07	20.52	20.47	36.19	38.17	36.07	36.05	37.41	37.02
20	0.09	20.53	20.50	29.68	30.97	31.20	30.98	32.53	31.96
30	0.11	20.54	20.54	25.90	27.21	28.20	27.80	29.39	28.98
40	0.12	20.55	20.58	23.09	24.39	25.89	25.55	27.17	26.77
50	0.14	20.55	20.63	20.87	22.05	24.11	23.73	25.39	24.98
60	0.16	20.54	20.68	18.98	20.19	22.63	22.27	23.83	23.49

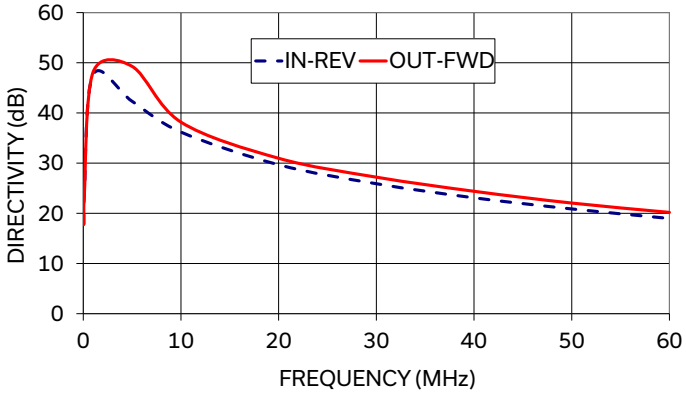
SYBDC-20-61WHP+
MAINLINE LOSS



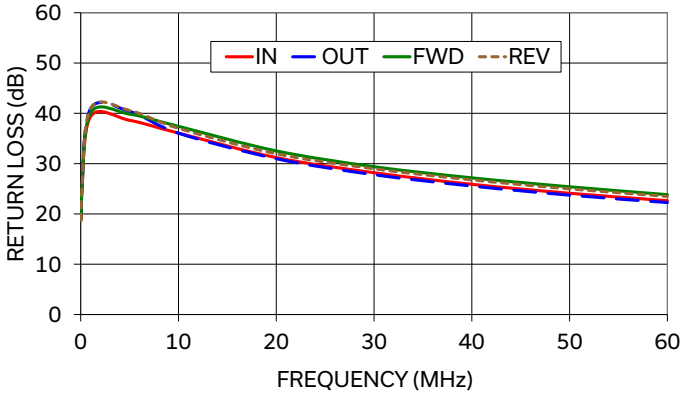
SYBDC-20-61WHP+
COUPLING



SYBDC-20-61WHP+
DIRECTIVITY



SYBDC-20-61WHP+
RETURN LOSS



NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html